

What is claimed is:

1. A temperature sensor comprising:
  - a wire comprising a resistance temperature detector (RTD) sensing material
  - 5 wrapped around a second flexible insulated core wire to form an assembly, and wherein a first end of the sensing wire is electrically connected to a first end of the core wire, the second end of the core wire providing a first lead;
  - an insulated lead wire electrically connected to a second end of the sensing wire to provide a second lead, the connection having a junction; and
- 10 shrink tubing encapsulating the assembly.
2. The sensor of claim 1, wherein the height of the sensor is about one-twentieth of an inch.
- 15 3. The temperature sensor of claim 2, wherein the core wire includes braided strands of conductive metal.
4. The temperature sensor of claim 3, wherein the core wire includes woven fiber glass insulation over the braided strands.
- 20 5. The temperature sensor of claim 4, wherein the wire comprising a sensing material includes one, or a combination of platinum, nickel, a nickel-iron alloy, and copper.
- 25 6. The temperature sensor of claim 5, wherein the electrical connections to the wires are made using one of soldering and brazing.

7. The temperature sensor of claim 6, wherein the sensor further comprises a strain relieving banding strap over the core wire and the second lead wire.
8. The temperature sensor of claim 7, wherein the banding strap includes brass.  
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9. The temperature sensor of claim 8, wherein the banding strap includes steel.
10. The temperature sensor of claim 9, wherein the banding strap is crimped around the core wire and the insulated lead wire.  
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11. The temperature sensor of claim 10, wherein the first and second lead wires exit the sensor at the same end.
12. The temperature sensor of claim 11, wherein an insulated lead wire is electrically connected to the second end of the core wire to provide the first lead.  
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13. The temperature sensor of claim 12, wherein a second banding strap is placed around the first and second lead wires.
- 20 14. The temperature sensor of claim 12, wherein the insulated wire leads withstand a five-pound pull force without separating from the assembly.
15. A temperature sensor produced by the method comprising:  
wrapping a first wire comprising a resistance temperature detector (RTD)  
25 sensing material around a flexible insulated core wire, creating a wire wrapped assembly;  
electrically connecting a first end of the sensing wire to the first end of the core wire;

providing leads for the temperature sensor by electrically connecting a first insulated lead to the second end of the sensing wire and using the second end of the core wire as a second lead of the temperature sensor;

5        placing the wire wrapped assembly into a heat shrinkable polymer material;  
and  
sealing the temperature sensor by heating the polymer material.

16.      The method of claim 15, wherein providing leads includes electrically connecting a second insulated lead to the second end of the core wire.

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17.      The method of claim 16, wherein the method further includes providing mechanical strain relief for the first and second leads.

18.      The method of claim 15, wherein placing the wire wrapped assembly into a  
15        heat shrinkable polymer material includes providing a first and a second layer of heat shrinkable tubing, wherein the second layer extends beyond ends of the first layer.

19.      The method of claim 18, wherein the first layer is heated before the assembly is placed into the second layer.

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20.      The method of claim 15, wherein electrically connecting to the sensing wire includes one of soldering and brazing.